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**National Oceanic and Atmospheric Administration**  
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NMFS Tracking  
No. 2003/00619

December 5, 2003

Malenna Cappellini  
United States Fish and Wildlife Service  
7501 Icicle Road  
Leavenworth, Washington 98826

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Mill Creek FRIMA Project (WRIA 45)

Dear Ms. Cappellini:

In accordance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended, 16 U.S.C. 1531, and the Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996, 16 U.S.C. 1855, the attached document transmits NOAA's National Marine Fisheries Service (NOAA Fisheries) biological opinion (Opinion) and MSA consultation based on our review of a proposal to fund and conduct the installation of a fish screen and several cross-vane weirs to provide appropriate fish passage at the Mill Creek Ditch, 0.7 river miles from the confluence of Mill Creek and Peshastin Creek in Chelan County, Washington. The United States Fish and Wildlife Service (FWS) determined that the proposed action was not likely to adversely affect the Upper Columbia River (UCR) spring chinook (*Oncorhynchus tshawytscha*) or UCR steelhead (*O. mykiss*) Evolutionarily Significant Units (ESU), and requested informal consultation. NOAA Fisheries requested additional information that indicated juvenile listed species are in the action area year round. Therefore, NOAA Fisheries did not concur with this determination, and initiated formal consultation on June 15, 2003.

This Opinion reflects the results of a formal ESA consultation and contains an analysis of effects covering the UCR spring chinook and UCR steelhead in the Mill Creek drainage of the Peshastin Creek watershed, in Chelan County, Washington. The Opinion is based on information provided in the Biological Assessment (BA), and additional information transmitted via telephone conversations and e-mail. A complete administrative record of this consultation is on file at the Washington Habitat Branch Office.



NOAA Fisheries concludes that implementation of the proposed project is not likely to jeopardize the continued existence of UCR spring chinook or UCR steelhead. In your review, please note that the incidental take statement, which includes Reasonable and Prudent Measures and Terms and Conditions, was designed to minimize take.

The MSA consultation concluded that the proposed project may adversely impact designated Essential Fish Habitat (EFH) for chinook (*O. tshawytscha*) and coho (*O. kisutch*) salmon. The Reasonable and Prudent Measures of the ESA consultation, and Terms and Conditions identified therein, would address the negative effects resulting from the proposed BPA funded actions. Therefore, NOAA Fisheries recommends that they be adopted as EFH conservation measures.

If you have any questions, please contact Diane Driscoll of the Washington Habitat Branch Ellensburg Field Office at (509) 962-8911 x 227 or [Diane.Driscoll@noaa.gov](mailto:Diane.Driscoll@noaa.gov).

Sincerely,

f.1

D. Robert Lohn  
Regional Administrator

Enclosure

cc: Steve Kolk, BOR  
Joel Teely, CCCD

# Endangered Species Act Section 7 Consultation Biological Opinion

and

## Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation

Mill Creek Fisheries Restoration and Irrigation Mitigation Program  
Upper Columbia River Steelhead and Upper Columbia River Spring Chinook  
Peshastin Creek Watershed  
Wenatchee River Subbasin  
Chelan County, Washington  
WRIA 45

Lead Action Agency: U.S. Fish and Wildlife Service

Consultation Conducted By: National Marine Fisheries Service,  
Northwest Region

Date Issued: December 5, 2003

Issued by:

 *Michael R Crouse*

D. Robert Lohn  
Regional Administrator

NMFS Tracking No.: 2003/00619

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## 1.0 INTRODUCTION

The Endangered Species Act (ESA) of 1973, as amended, (16 U.S.C. 1531-1544), establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with the National Marine Fisheries Service (NOAA Fisheries) and United States Fish and Wildlife Service (FWS) (together “the Services”), as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species. This biological opinion (Opinion) is the product of an interagency consultation pursuant to section 7(a)(2) of the ESA and implementing regulations 50 CFR 402.

The analysis also fulfills the Essential Fish Habitat (EFH) requirements under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended, (16 U.S.C. 1801 *et seq.*). The Sustainable Fisheries Act of 1996 (Public Law 104-267), amended the MSA to establish procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan. Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (section 305(b)(2)).

The FWS, Bureau of Reclamation (BOR), and Chelan County Conservation District (CCCD) propose to fund all or part of a project to improve fish passage and irrigation screening of the Mill Creek Ditch in the Peshastin Watershed, Chelan County, Washington.

The proposed action will occur within the geographic boundary and habitat of the Upper Columbia River (UCR) steelhead (*Oncorhynchus mykiss*) and UCR spring chinook (*O. tshawytscha*) Evolutionarily Significant Units (ESU), both listed as endangered under the ESA. The proposed Action Area is within areas designated as EFH for chinook and coho (*O. kisutch*) salmon. The administrative record for this consultation is on file at the Washington Habitat Branch office.

### 1.1 Background and Consultation History

NOAA Fisheries received a biological assessment (BA) and EFH assessment prepared by the FWS on the Mill Creek Fisheries Restoration and Irrigation Mitigation (FRIMA) Project on May 29, 2003. The FWS requested concurrence with a determination of “may affect, not likely to adversely affect” for UCR steelhead and UCR spring chinook ESUs. NOAA Fisheries requested additional information on known fish distribution in Mill Creek. In 1992 the United States Department of Agriculture (USDA) Wenatchee National Forest collected electroshocking information showing that *O. mykiss* use the lower two miles of Mill Creek, including the project area. In addition, UCR steelhead and UCR spring chinook use Peshastin Creek, immediately downstream of the project area, for spawning and rearing. Therefore, listed species are likely to be present in the action area. After confirmation of the fish distribution in Mill Creek, NOAA Fisheries informed FWS on June 6, 2003 that formal consultation was required. The FWS agreed with NOAA Fisheries’ finding and formal consultation was initiated on June 15, 2003.

## 1.2 Proposed Action

Proposed actions are defined in the Services' consultation regulations (50 CFR 402.02) as "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas." In addition, United States Code (16 U.S.C. 1855(b)(2)) further defines a Federal action as "any action authorized, funded, or undertaken or proposed to be authorized, funded, or undertaken by a Federal agency." Because the FWS proposes to fund the action that may affect listed resources, it must consult under ESA section 7(a)(2) and MSA section 305(b)(2).

According to the BA, the FWS, BOR, and CCCD are cooperatively aiding to a private landowner to improve fish passage and screening at the Mill Creek ditch. The Mill Creek ditch is a small irrigation ditch (less than 10 cubic feet per second (cfs)) on Mill Creek, roughly 0.7 miles upstream of the confluence with Peshastin Creek. The landowner has been proactive in conserving water by placing the original ditch into a pipe system in 1990. The subject of this consultation is a proposal install appropriate screening of the irrigation intake and improve fish passage both upstream and downstream of the diversion.

The project consists of two actions, replacing the fish screen in an existing diversion structure and installing cross-vane log weirs in the channel to restore upstream passage. A temporary stream diversion will allow work to occur in a dry channel. Installation of a rotary flat plate fish screen, will enable the diversion to meet NOAA Fisheries' juvenile fish screen criteria (NMFS 1995). Past management and maintenance of the existing diversion structure have created a 4-foot vertical drop in the streambed downstream of the intake. This drop inhibits upstream passage at low flows. Installation of a series of cross-vane log weirs will restore adult and juvenile fish passage.

The FWS will install six weirs, roughly 10 feet apart, starting just downstream of the existing concrete apron for the diversion. Stabilizing the cross-vane weirs will require some streambank excavation. The logs will extend a minimum of three feet into the streambank. Each weir will contain three logs of roughly the same diameter. A precast concrete block will serve as the foundation and clean gravel will provide the backfill. The FWS will attach geotextile fabric to the log structure that will extend five feet into the bank or roughly the bankfull width, whichever is less. The FWS will cover the geotextile fabric with six-inch quarry spalls followed by 12- to 24-inch diameter riprap, to protect the excavated area. The FWS will backfilling the riprap with soil to allow planting of riparian vegetation. Weir construction will require approximately 250 cubic yards of excavation, and will disturb an area roughly 100 feet long and 20 feet wide.

Construction activities will disturb approximately 2,800 square feet of riparian area. Work will take approximately two weeks to complete and will occur during low flows between November 1 and December 30, 2003. Most of the vegetation in the area is grass, brush and small vine maple. The FWS will not remove any trees over 4-inches diameter and will replant all disturbed areas with native grasses, shrubs and trees.

### **1.3 Description of the Action Area**

An action area is defined by the Services' regulations (50 CFR Part 402) as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The action area affected by the proposed action extends approximately 200 feet downstream from the concrete apron of the existing Mill Creek diversion, as excavation will extend approximately 100 feet downstream of the diversion, and may affect water quality for another 100 feet downstream of the excavation areas.

The diversion is on Mill Creek 0.7 miles upstream of the confluence with Peshastin Creek. Peshastin Creek is a tributary to the Wenatchee River. Mill Creek is a first order, four-mile long tributary with a five-square mile drainage area that enters Peshastin Creek at river mile (RM) 4.8. Mill Creek is the only perennial tributary entering Peshastin Creek below RM 6.0 and contributes roughly 1 to 2 cfs to the Peshastin Creek stream flow during low summer flows. Most of Mill Creek's drainage area is within the boundaries of the USDA Wenatchee National Forest, with only the lower 0.8 miles of stream flowing through private property. Road development, timber harvest and forest fires have all affected habitat within the subwatershed. Culverts upstream of the proposed irrigation diversion site impede fish passage. The lower two miles of Mill Creek provides *O. mykiss* rearing and possibly spawning habitat (J. Haskins, pers. comm. 2003; Andonaegui 2001).

## **2.0 ENDANGERED SPECIES ACT BIOLOGICAL OPINION**

The objective of this Opinion is to state the determination of whether the effect of the proposed project, together with effects from the baseline and cumulative effects, is likely to jeopardize the continued existence of the UCR spring chinook and/or UCR steelhead ESUs.

### **2.1 Evaluating the Effects of the Proposed Action**

The standards for determining jeopardy as set forth in section 7(a)(2) of the ESA are defined by 50 CFR part 402 (the consultation regulations). NOAA Fisheries must determine whether the action is likely to jeopardize the listed species. This analysis involves the initial steps of (1) defining the biological requirements of the listed species and (2) evaluating the relevance of the environmental baseline to the species' current status.

Next, NOAA Fisheries evaluates if the species can be expected to survive with an adequate potential for recovery. In making this determination, NOAA Fisheries considers estimated levels of injury and mortality attributed to: (1) collective effects of the proposed or continuing action; (2) the environmental baseline; and (3) any cumulative effects. This evaluation must consider measures for survival and recovery specific to the listed salmonid's life stages that occur beyond the action area. If NOAA Fisheries finds the action is likely to jeopardize, NOAA Fisheries must identify reasonable and prudent alternatives for the action.

### 2.1.1 Biological Requirements

The first step in the methods NOAA Fisheries uses for applying ESA section 7(a)(2) to listed salmon is to define the species' biological requirements. The biological requirements are conditions those necessary for the listed species to survive and recover to naturally reproducing population levels when protection under the ESA would be unnecessary. Species or ESUs not requiring ESA protection have the following attributes: population sizes large enough to maintain genetic diversity and heterogeneity; the ability to adapt and to survive environmental variation; and are self-sustaining in the natural environment.

The UCR spring chinook and UCR steelhead share similar basic biological requirements. These requirements include sufficient food, flowing water (quantity), high quality water (cool, free of pollutants, high dissolved oxygen concentrations, low sediment content), clean spawning substrate, and unimpeded migratory access to and from spawning and rearing areas (adapted from Spence *et al.* 1996). The specific biological requirements that will be affected by the proposed action include water quality, food, and unimpeded migratory access.

### 2.1.2 Status and Generalized Life History of Listed Species

NOAA Fisheries also considers the current status of the listed species; considering population size, trends, distribution, and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its original decision to list the species for protection under the ESA. In addition, the assessment will consider any new information or data that are relevant to the determination.

The listing status and biological information for NOAA Fisheries listed species that are the subject of this consultation are described below in Table 1.

<b>Species</b>	<b>Listing Status</b>	<b>Critical Habitat</b>	<b>Protective Regulations</b>	<b>Biological Information</b>
Upper Columbia River spring-run chinook salmon	March 24, 1999; 64 FR 14308, Endangered	Not Designated <sup>1</sup>	July 10, 2000; 65 FR 42422	Myers <i>et al.</i> 1998; Healey 1991
Upper Columbia River steelhead	August 18, 1997; 62 FR 43937, Endangered	Not Designated <sup>1</sup>	July 10, 2000; 65 FR 42422	Busby <i>et al.</i> 1995; 1996

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<sup>1</sup>Under development. On April 30, 2002, the U.S. District Court for the District of Columbia approved a NOAA Fisheries consent decree withdrawing a February 2000 Critical Habitat designation for this and 18 other ESUs.

Table 1. References to Federal Register Notices containing additional information concerning listing status, and biological information for listed and proposed species considered in this biological opinion.

#### *2.1.2.1 Upper Columbia River Spring Chinook*

The UCR spring chinook salmon ESU, listed as endangered on March 24, 1999 (64 FR 14308), includes all natural-origin, stream-type chinook salmon from river reaches above Rock Island Dam and downstream of Chief Joseph Dam, including the Wenatchee, Entiat, and Methow River subbasins. All chinook in the Okanogan River are apparently ocean-type and are part of the UCR summer- and fall-run ESU. The UCR spring chinook ESU also includes the spring-run components of the following hatchery stocks: Chiwawa, Methow, Twisp, Chewuch, and White rivers and Nason Creek. Critical Habitat is not presently designated for UCR spring chinook, although a designation is forthcoming (see footnote <sup>1</sup>).

The populations are genetically and ecologically separate from the summer- and fall-run populations in the lower parts of many of the same river systems (Myers *et al.* 1998). Although fish in this ESU are genetically similar to spring chinook in adjacent ESUs (*i.e.*, mid-Columbia and Snake), are ecological differences in spawning and rearing habitat preferences are evident. For example, spring-run chinook in upper Columbia tributaries spawn at lower elevations (1,600 to 3,200 feet) than in the Snake and John Day River systems.

During the Grand Coulee Fish Maintenance Project (1939 through 1943) populations upstream of Rock Island Dam were intermixed, resulting in a loss of genetic diversity between populations in the ESU. Homogenization remains an important feature of the ESU. Fish abundance has trended downward both recently and over the long-term. At least six former populations from this ESU are now extinct, and nearly all existing populations have experienced escapements of less than 100 wild spawners in recent years. Adult UCR spring chinook are not likely to be present during the construction activities (late fall). Juvenile UCR spring chinook rearing in Peshastin Creek may be found in the action area because juveniles often seek refuge in tributaries.

*Life History.* The UCR spring chinook are stream-type fish, smolting as yearlings. Most stream-type fish mature after four years. Few coded-wire tags are recovered in ocean fisheries, suggesting the fish move quickly out of the north-central Pacific and do not migrate along the coast.

*Habitat and Hydrology.* Salmon in this ESU must pass up to nine Federal and public utility district dams. Chief Joseph Dam prevents access to historical spawning grounds further upstream. Degradation of remaining spawning and rearing habitat continues to be a major concern associated with urbanization, irrigation projects, and livestock grazing along riparian corridors. Overall harvest rates are low for this ESU, presently less than 10% (Oregon Department of Fish and Wildlife and WDFW 1995).

*Hatchery Influence.* Fish managers introduced spring-run chinook salmon from the Carson National Fish Hatchery (a large composite, nonnative stock) into the Wenatchee subbasin in the middle 1900's. Evidence suggests that these hatchery fish, do not regularly stray into wild areas or hybridize with naturally spawning populations. Since 2000, the FWS has planted nonlisted Carson stock adults from the Leavenworth Fish Hatchery in Peshastin Creek because naturally returning numbers are low. Besides the National Fish Hatchery, the Washington State Department of Fish and Wildlife (WDFW) operates two supplementation hatcheries in this ESU. The Methow Fish Hatchery Complex (operations began in 1992) and the Rock Island Fish Hatchery Complex (operations began in 1989) were both designed to supplement naturally spawning populations on the Methow and Wenatchee rivers, respectively (Chapman *et al.* 1995).

*Population Trends and Risks.* For the UCR spring chinook salmon ESU as a whole, NOAA Fisheries estimates that the long-term population growth rate ( $\lambda$ ) ranges from 0.83 to 0.86, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of wild origin (McClure *et al.* 2003). In addition, McClure *et al.* (2003) estimate a 95% probability of a 90% decline in 50 years and a 90% probability of extinction in 50 years across all stocks within the ESU. A 22% increase in population growth rate is necessary to reduce the 50 year risk of extinction to less than five percent.

NOAA Fisheries has also used population risk assessments for UCR spring chinook salmon and steelhead ESUs from the draft Quantitative Analysis Report (QAR) (Cooney 2000). Risk assessments described in that report were based on Monte Carlo simulations with simple spawner/spawner models that incorporate estimated smolt carrying capacity. Cooney (2000) simulated population dynamics for three separate spawning populations in the UCR spring chinook salmon ESU, the Wenatchee, Entiat, and Methow populations. The QAR assessments showed extinction risks for UCR spring chinook salmon of 50% for the Methow, 98% for the Wenatchee, and 99% for the Entiat spawning populations. These estimates are based on the assumption that the median return rate for the 1980 brood year to the 1994 brood year series will continue into the future.

#### *2.1.2.2 Upper Columbia River Steelhead*

The UCR steelhead ESU, listed as endangered on August 18, 1997 (62 FR 43937), includes all natural-origin populations of steelhead in the Columbia River basin upstream from the Yakima River in Washington, to the U.S./Canada border, including the Wells Hatchery stock. Presently, there is no critical habitat designated for UCR steelhead, although a designation is forthcoming (see footnote 1).

Estimates of historical (pre-1960s) abundance specific to this ESU are available from fish counts at dams. Counts at Rock Island Dam from 1933 to 1959 averaged 2,600 to 3,700, suggesting a pre-fishery run size exceeding 5,000 adults for tributaries above Rock Island Dam (Chapman *et al.* 1994). Juvenile *O. mykiss* are present in the action area and UCR steelhead use nearby Peshastin Creek, just downstream of the action area for spawning and rearing.

*Life History.* As in other inland ESUs (the Snake and mid-Columbia River basins), steelhead in the UCR ESU remain in freshwater up to a year before spawning. The dominant smolt age is two years old. Based on limited data, it appears that steelhead from the Wenatchee and Entiat rivers return to freshwater after one year in the ocean, whereas Methow River steelhead are primarily age-2-ocean (Howell *et al.* 1985). Life history characteristics for UCR steelhead are similar to those of other inland steelhead ESUs; however, some of the oldest smolt ages for steelhead, up to seven years, are reported from this ESU. The relationship between anadromous and nonanadromous forms in the geographic area are unclear.

*Habitat and Hydrology.* The Chief Joseph and Grand Coulee Dam construction caused loss of access to large areas of habitat, as did that of smaller dams on tributary rivers. Habitat issues for this ESU relate mostly to irrigation diversions and hydroelectric dams, plus degraded riparian and instream habitat from urbanization and livestock grazing.

*Hatchery Influence.* Hatchery fish are widespread and escape to spawn naturally throughout the region. Hatchery-produced fish dominate the spawning escapement.

*Population Trends and Risks.* For the UCR steelhead ESU as a whole, NOAA Fisheries estimates the mean population growth rate ( $\lambda$ ) ranges from 0.63 to 1.00, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of wild origin (McClure *et al.* 2003). NOAA Fisheries has also estimated the risk of 90% declines in 50 years at 19%. McClure *et al.* (2003) were unable to estimate the risk of absolute extinction for the UCR steelhead ESU because total spawner counts, age distributions of returning spawners, and estimates of the fraction of spawners that were wild-born in the time series were not available for all stocks. Because of data limitations, the QAR steelhead assessments in Cooney (2000) were limited to two aggregate spawning groups-the Wenatchee/Entiat composite and the above-Wells Dam populations. Wild production of steelhead above Wells Dam was assumed to be limited to the Methow system. Assuming a relative effectiveness of hatchery spawners of 1.0, the risk of extinction within 100 years for UCR steelhead is 100%. The QAR also assumed hatchery effectiveness values of 0.25 and 0.75. A hatchery effectiveness of 0.25 resulted in projected risks of extinction of 35% for the Wenatchee/Entiat and 28% for the Methow populations. At a hatchery effectiveness of 0.75, risks of 100% extinction were projected for both populations.

### 2.1.3 Environmental Baseline

The environmental baseline is defined as: "the past and present impacts of all Federal, state, or private actions and other human activities in the action area, including the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation and the impacts of state and private actions that are contemporaneous with the consultation in progress" (50 CFR 402.02). In step 2 of the jeopardy analysis, NOAA Fisheries' evaluates the relevance of the environmental baseline in the action area to the species' current status.

In general, the environment for listed species in the Columbia River Basin (CRB), including those that migrate past or spawn upstream from the action area, has been dramatically affected by the development and operation of the Federal Columbia River Power System (FCRPS). Storage dams have eliminated mainstem spawning and rearing habitat, and have altered the natural flow regime of the Snake and Columbia rivers, decreasing spring and summer flows, increasing fall and winter flow, and altering natural thermal patterns. Power operations cause fluctuation in flow levels and river elevations, affecting fish movement through reservoirs, disturbing riparian areas and possibly stranding fish in shallow areas as flows recede. The eight dams in the migration corridor of the Snake and Columbia rivers kill or injure a portion of the smolts passing through the area. The low velocity movement of water through the reservoirs behind the dams slows the smolts' journey to the ocean and enhances the survival of predatory fish (Independent Scientific Group 1996, National Research Council Committee 1996). Formerly complex mainstem habitats in the Columbia River have been reduced, for the most part, to single channels, with floodplains reduced in size, and off-channel habitats eliminated or disconnected from the main channel (Sedell and Froggatt 1984; Independent Scientific Group 1996; and Coutant 1999). The amount of large woody debris in the upper Columbia River has declined, reducing habitat complexity and altering the rivers' food webs (Maser and Sedell 1994).

Other human activities that have degraded aquatic habitats or affected native fish populations in the CRB include stream channelization, elimination of wetlands, construction of flood control dams and levees, construction of roads (many with impassable culverts), timber harvest, splash dams, mining, water withdrawals, unscreened water diversions, agriculture, livestock grazing, urbanization, outdoor recreation, fire exclusion/suppression, artificial fish propagation, fish harvest, and introduction of non-native species (Henjum *et al.* 1994; Rhodes *et al.* 1994; National Research Council Committee (NRCC) 1996; Spence *et al.* 1996; and Lee *et al.* 1997). In many watersheds, land management and development activities have: (1) reduced connectivity (i.e., the flow of energy, organisms, and materials) between streams, riparian areas, floodplains, and uplands; (2) elevated fine sediment yields, degrading spawning and rearing habitat; (3) reduced large woody material that traps sediment, stabilizes streambanks, and helps form pools; (4) reduced vegetative canopy that minimizes solar heating of streams; (5) caused streams to become straighter, wider, and shallower, thereby reducing rearing habitat and increasing water temperature fluctuations; (6) altered peak flow volume and timing, leading to channel changes and potentially altering fish migration behavior; and (7) altered floodplain function, water tables and base flows (Henjum *et al.* 1994; McIntosh *et al.* 1994; Rhodes *et al.* 1994; Wissmar *et al.* 1994; NRCC 1996; Spence *et al.* 1996; and Lee *et al.* 1997).

#### *2.1.3.1 Factors Affecting Species in the Action Area*

Mill Creek is a first order, four-mile long tributary with a five square mile drainage area that enters Peshastin Creek at river mile (RM) 4.8. Mill Creek is the only perennial tributary entering Peshastin Creek below RM 6.0 and contributes roughly 1 to 2 cfs to the Peshastin Creek low summer stream flow. Most of Mill Creek's drainage area is within the boundaries of the Wenatchee National Forest with only the lower 0.8 miles of stream flowing through private

property.

The Mill Creek subwatershed, like the surrounding Peshastin Creek watershed, has been heavily managed including roads and timber harvest in riparian areas of the upper watershed. Like Peshastin Creek, water withdrawals have also negatively affected the overall functional capacity of the watershed. Culverts upstream of the proposed project site impede upstream fish passage. The lower two miles of Mill Creek support *O. mykiss* rearing and possibly spawning (J. Haskins, pers. comm. 2003; Andonaegui 2001). Stream flow in Mill Creek in November (the proposed work window) is estimated at 1 cfs.

The major factors affecting UCR spring chinook and UCR steelhead within the action area include irrigation withdrawals, agricultural practices, historic and current logging practices, and residential development. NOAA Fisheries sometimes uses the Matrix of Pathways and Indicators (MPI) (NMFS 1996) to analyze and describe the effects of these factors on the functional condition of salmon and steelhead habitat elements. The MPI relates the biological requirements of listed species to a suite of habitat variables. In the analysis presented here, each factor is categorized according to the condition of relevant pathways and associated indicators. The categories are *properly functioning*, *at risk*, or *not properly functioning*.

*Water Quality: Temperature.* No temperature data for Mill Creek is available. However, Peshastin Creek, less than one mile downstream, is functioning at unacceptable risk for this indicator. The mainstem Peshastin Creek is on the Washington State 303(d) list for failing to meet temperature criteria. Because of excessive roads and timber harvest in the upper watershed, in many areas the stream is poorly shaded. Summer flows in Mill Creek are very low. From the limited data available, it seems likely that Mill Creek is at best *functioning at risk*.

*Water Quality: Sediment/Turbidity.* A stream survey of the lower half of Mill Creek in the late 1990's reported that 80% of the habitat units were embedded. For these reasons, sediment levels in Mill Creek are *not properly functioning*.

*Water Quality: Chemical Contamination/Nutrients.* No data are available for these criteria in Mill Creek. Most of Mill Creek is within the Wenatchee National Forest and is considered functioning appropriately for this indicator. The lower 0.8 miles of Mill Creek are on private land that, until recently, was used for agriculture (orchard) as is most of the adjacent private land. Although there is no specific information available on Mill Creek, the state has listed several other streams in the lower Wenatchee River subbasin that flow through agricultural areas (including Peshastin Creek) 303(d) list for temperature, nutrients and contaminants. Because the proposed project will occur in the private land portion of Mill Creek and the influences of agricultural practices in the area are unknown, this indicator is conservatively considered *functioning at risk*.

*Habitat Access: Physical Barriers.* Fish passage is limited or impeded by culverts at road crossings and irrigation diversions. The first culvert at RM 1.0 is considered a partial barrier.

However, stream survey data have documented *O. mykiss* upstream of this barrier in the past. Activities at the Mill Creek Ditch diversion have resulted in a 4-foot falls in the project area that is a juvenile upstream passage barrier. This indicator is *not functioning properly*.

*Habitat Elements: Substrate, Large Woody Debris (LWD), Pool Frequency and Quality, Off-Channel Habitat, and Refugia.* A stream survey conducted by the USDA Wenatchee National Forest in Mill Creek in the late 1990's indicated that gravel and sand are the dominant substrate and 80% of the habitat units are embedded. Very little LWD is found in the channel and recruitment is limited because of past harvest practices. More than 95% of the habitat units in Mill Creek are riffles and no large pools (greater than three feet deep) were documented during the survey. The most recent stream survey did not identify any ponds, oxbows, backwaters, off-channel or refugia areas. Therefore, all of the habitat element indicators are *not functioning properly*.

*Channel Condition and Dynamics: Width/Depth Ratio, Streambank Condition, Floodplain Connectivity, Flow/Hydrology, Drainage Network.* There is no specific information available on the width/depth ratio of Mill Creek. During the most recent stream survey, 270 lineal feet of streambank was actively eroding. However, fire activity and past timber management have reduced the effective riparian vegetation by more than one-half. Roads confine the stream in several areas and reduce the floodplain connectivity. Although a hydrograph specific to Mill Creek is not available, it is likely that past management practices, fire activity, and irrigation withdrawals have altered peak flow, base flow, and flow timing relative to an unmanaged watershed of similar size, geology and geography. Approximately 0.8 miles of road are within 200 feet of Mill Creek, and several more miles of active and decommissioned roads are found in the upper watershed. The density and location of roads have likely increased the drainage network in the watershed. For the above reasons, all channel condition and dynamics indicators are considered *not functioning properly*.

*Watershed Conditions: Road Density/Location, Disturbance History, and Riparian Reserves.* Road density in Mill Creek is not extensive, between 1.0 and 2.4 miles of road per square mile of watershed. However, the 0.8 miles of road within 200 feet of the stream channel are negatively affecting the functional condition of the watershed by constraining the stream, interfering with groundwater and runoff patterns, and contributing sediment to the stream channel. Disturbance events in the watershed include roads, timber harvest, agriculture, high intensity forest fires and debris torrents. Management practices and disturbance events have both reduced density and effectiveness of the stream riparian area. All watershed condition variables are considered *not functioning properly*.

#### 2.1.4 Relevance of Baseline to Status of Species

The existing environmental baseline does not meet the biological requirements of the listed species. The survival and recovery of these species depends on their ability to persist through periods of low natural survival due to ocean conditions, climatic conditions, and other conditions outside the action area. For instance, ocean conditions are a key factor in the productivity of

Pacific salmon populations. Stochastic events in freshwater (flooding, drought, snowpack conditions, volcanic eruptions, etc.) can also play an important role in a species' survival and recovery, but those effects are often localized compared to the effects associated with the ocean.

Freshwater survival is particularly important during these periods of low natural survival outside the action area, because enough smolts must be produced so that a sufficient number of adults can survive to complete their oceanic migration, return to spawn, and perpetuate the species. Variation in the freshwater and marine environments substantially affects Pacific salmon populations. Therefore it is important to maintain or restore *properly functioning condition (PFC)* to sustain the ESU through these low survival periods. Accordingly, conditions in the action area would have to improve, and any further degradation of the baseline, or delay in improvement of these conditions would probably further decrease the likelihood of survival and recovery of the listed species under the environmental baseline conditions.

To address problems inhibiting salmonid recovery in CRB tributaries, the Federal resource and land management agencies developed the *All H Strategy* (Federal Caucus 2000). Components of the *All H Strategy* commit these agencies to increased coordination and a fast start on protecting and restoring. Additional details about the importance of freshwater survival to Pacific salmon populations can be found in Federal Caucus (2000), NOAA Fisheries (2000), and Oregon Progress Board (2000).

## **2.2 Analysis of Effects**

Effects of the action are defined as "the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with the action, that will be added to the environmental baseline" (50 CFR 402.02). "Interrelated actions are those that are part of a larger action and depend on the larger action for their justification" (50 CFR 403.02). "Interdependent actions are those that have no independent utility apart from the action under consideration" (50 CFR 402.02).

### **2.2.1 Species and Habitat Effects of the Action**

NOAA Fisheries will consider any scientifically credible analytical framework for determining an activity's effect. In order to streamline the consultation process and to lead to more consistent effects determinations across agencies, NOAA Fisheries, where appropriate, recommends that action agencies use the MPI and procedures in NOAA Fisheries' guidance document "Making Endangered Species Act Determinations of Effect for Individual or Group Actions at the Watershed Scale" (1996), particularly when their proposed action would take place in forested montane environments. NOAA Fisheries is working on similar procedures for other environments. Regardless of the analytical method used, if a proposed action is likely to impair properly functioning habitat, reduce the function of already impaired habitat, or retard the long-term progress of impaired habitat toward PFC, it cannot be found consistent with conserving the species.

For the streams typically considered in salmon habitat-related consultations, a watershed is a logical unit for analysis of potential effects of an action (particularly for actions that are large in scope or scale). Healthy salmonid populations use habitats throughout watersheds (Naiman *et al.* 1992), and riverine conditions reflect biological, geological and hydrological processes operating at the watershed level (Nehlsen *et al.* 1997; Bisson *et al.* 1997; and NMFS 1999). Although NOAA Fisheries prefers watershed-scale consultations due to greater efficiency in reviewing multiple actions, increased analytic ability, and the potential for more flexibility in management practices, often it must analyze effects at geographic areas smaller than a watershed or basin due to a proposed action's scope or geographic scale. Analyses that are focused at the scale of the site or stream reach may not be able to discern whether the effects of the proposed action will contribute to or be compounded by the aggregate of watershed impacts. This loss of analytic ability typically should be offset by more risk averse proposed actions and ESA analysis in order to achieve parity of risk with the watershed approach (NMFS 1999).

The project is located in an area that provides rearing and possibly spawning habitat for both UCR spring chinook and steelhead, therefore the construction activities associated with the upgrade of the fish screen and improvements in passage are likely to adversely affect UCR spring chinook and UCR steelhead. The BA for the Mill Creek FRIMA Diversion Project provides an analysis of the effects of the proposed action on listed species and their habitat in the action area. The analysis uses the MPI and procedures in NOAA Fisheries' 1996 guidance, and the best scientific and commercial data available to evaluate elements of the proposed action that have the potential to affect the listed fish or essential features of their critical habitat.

#### *2.2.1.1 Direct Effects to Species and Habitat*

Direct effects are the immediate effects of the project on the species or its habitat. Direct effects result from the agency action and include the effects of interrelated or interdependent actions. Direct effects occur at the project site and may extend upstream or downstream based on the potential for impairing the value of habitat for meeting the species' biological requirements or impairing the essential features of critical habitat. Future Federal actions that are not a direct effect of the action under consideration (and not included in the environmental baseline or treated as indirect effects) are not evaluated.

Data from the USDA Wenatchee National Forest indicated that *O. mykiss* use at least the lower two miles of Mill Creek year round. Peshastin Creek, 0.7 miles downstream, provides migration, spawning and rearing habitat for both juvenile and adult UCR steelhead and UCR spring chinook. However, because of the proposed timing for the work, adult UCR spring chinook are not expected to be in the area. Moreover, the approved work window will capitalize on a time of the year when flows in Mill Creek are too low for spawning UCR steelhead or UCR spring chinook or redds to be present. While the low flow in Mill Creek (estimated at 1 cfs during the expected construction window) makes it very unlikely that adult fish would be in the area, adult steelhead could be present in Peshastin Creek, and if flows increase they might try to move up into Mill Creek.

*Worksite Isolation and Fish Handling.* To the degree that fish are in the area, harm from construction effects could result. In order to minimize the number of fish that could be harmed by construction effects, the FWS will isolate the worksite and remove any fish from the isolated area. Isolating the work area and temporarily diverting the creek can itself strand juvenile salmonids, potentially killing them. Handling fish can increase plasma levels of cortisol and glucose in fish (Hemre and Krogdahl 1996, Frisch and Anderson 2000), which is indicative of stress.

Because of the expected low flow at the approved construction time, FWS will not conduct electrofishing, significantly reducing potential injury. After excavating a 100-foot temporary channel and lining it with clean gravel, block nets will be placed at the ends of the channel to be diverted and qualified FWS biologists will use seines and/or dipnets to remove any fish that may be in the blocked off section. After ensuring that all fish have been removed, cofferdams will be placed at the upstream end to divert the flow into the temporary channel. The temporary channel will be constructed in a manner that ensures safe fish passage in the event that flows increase or migrating fish are present during the in-water work period. Although these techniques are intended to reduce the number of fish that will experience construction effects, netting and handling can injure or kill fish. However, use of trained personnel will reduce the likelihood of lethal effects to steelhead or chinook.

*Habitat Element: Turbidity.* Construction activities associated with this project that are likely to mobilize sediment include: (1) channel excavation; (2) bank excavation; (3) rock and log placement; and (4) other activities associated with the installation of the log weirs. In the immediate vicinity of the construction activities and for a short distance downstream (within 100 feet), the level of turbidity will likely exceed the natural background levels temporarily and potentially affect listed UCR steelhead and UCR spring chinook that may still be in the action area, but outside of the isolated work area.

Quantifying turbidity levels, and their effect on fish species, is complicated by several factors. First, turbidity from an activity will typically decrease as distance from the activity increases. How quickly turbidity levels attenuate is dependent upon the quantity of materials in suspension (e.g., mass or volume), the particle size of suspended sediments, the amount and velocity of ambient water (dilution factor), and the physical/chemical properties of the sediments. Second, the impact of turbidity on fish is not only related to the turbidity levels, but also the particle size of the suspended sediments.

For salmonids, turbidity has been linked to a number of behavioral and physiological responses (i.e., gill flaring, coughing, avoidance, increase in blood sugar levels) which indicate some level of stress (Bisson and Bilby 1982; Sigler *et al.* 1984; Berg and Northcote 1985; Servizi and Martens 1992). The magnitude of these stress responses is generally higher when turbidity is increased and particle size decreased (Bisson and Bilby 1982; Servizi and Martens 1987; Gregory and Northcote 1993). Although turbidity may cause stress, Gregory and Northcote (1993) have shown that moderate levels of turbidity accelerate foraging rates among juvenile chinook salmon, likely because of reduced vulnerability to predators (camouflaging effect).

To avoid or minimize the effects of possible increased turbidity on listed fish, the project incorporates measures including restricting timing and duration of construction, temporarily diverting the stream flow so that construction can occur in dry areas, temporary erosion and sediment control measures, and adherence to Washington State water quality standards and the use of a mixing zone. The use of a mixing zone is to ensure that turbidity levels generated by the action do not exceed 5 nephelometric turbidity units (NTU) above background levels when the background is 50 NTU or less; or a 10% increase in turbidity when the background turbidity is more than 50 NTU (as described in the Washington Department of Ecology (WDOE) 2003 Washington State Water Quality Standards for Surface Waters of the State, WAC 173-201A-200(1)(e), and WAC 201A-200(e)(I)). The mixing zone for this area is 100 feet downstream from the construction site.

Mixing zones are geographically and temporally limited authorization (a few hours or a few days) for exceedance of water quality standards, to be used during project construction. Outside of the mixing zone, turbidity should not be detectable above background levels. A mixing zone is allowed only after implementation of appropriate best management practices to avoid or minimize disturbance of sediment. Any deposition of suspended sediments within the action area will be flushed out, either when flow is reestablished or during the next high flow event (rain or snowmelt). Other than the short-term inputs mentioned above, this project will not add to the existing baseline turbidity or sedimentation levels within the Action Area.

*Habitat Element: Substrate.* Work within the stream channel is likely to mobilize existing sediment (effects to fish are described above), disturb instream habitat, and displace benthic fauna in the immediate area. When the particles causing turbidity settle out of the water column, they contribute to sediment on the riverbed (sedimentation). Turbidity and subsequent sedimentation can affect the quality of stream substratum as spawning material, influence the exchange of streamflow and shallow alluvial groundwater, occupy channel storage areas for cobbles and gravels, increase width-depth ratios, depress riverine productivity, and contribute to decreased salmonid growth rates (Waters 1995; Newcombe and Jensen 1996; Shaw and Richardson 2001).

Heavy equipment in the riparian area and within the streambed can cause compaction of soils resulting in reduced infiltration at the project site. Compacting the soil decreases the stability of the banks, and reduces the recruitment of riparian vegetation, which results in increased deposition of fine sediments into the stream. Lost foraging opportunities resulting from the disturbance of the Mill Creek streambed (displaced benthic fauna) will likely be short-lived as invertebrates will quickly recolonize the disturbed substrate (Allan 1995). Invertebrates (e.g., larval insects, obligate aquatic insects, molluscs, crustaceans etc.) recolonize disturbed areas by drifting, crawling, swimming, or flying in from adjacent areas (Mackay 1992).

Long-term effects to prey abundance and habitat are not anticipated because: (1) only limited excavation of the streambed is required; (2) equipment will work from the streambank to the maximum extent practicable; and (3) adjacent undisturbed areas will provide adequate levels of benthic food sources and recolonization potential.

*Habitat Element: Streambank Condition.* Streambanks are transition zones between terrestrial and aquatic environments. Banks of small streams often provide the habitat edges necessary to maintain high populations of salmonids. Salmonids are attracted to this habitat interface because stable, well-vegetated banks provide cover, control water velocities and temperatures and supply terrestrial foods. The condition of the banks often governs the depths and water velocities in which fish must live. Streamside vegetation directly influences the quality of salmonid habitat. Overstory riparian vegetation directly affects cover, food, and streambank stability, as does the understory, but it also provides shade, resulting in increased rearing space and cool waters that favor salmonid growth. Riparian vegetation acts as a filter to prevent addition of sediment, and its roots provide streambank stability and cover for rearing fish.

Clearing will cause a temporary loss in vegetative cover in order to provide equipment access to the stream channel and placement of the log weirs. Loss of streamside vegetation reduces cover, and foodsource for salmonids, and locally increases temperature variability. Heavy equipment can break down stream banks and compact the soils, increasing the sediment introduced to the stream channel, and reducing streambank stability and infiltration capacity of the soil, which diminish the suitability for salmonids.

Outside of excavation areas, vegetation will be mowed and not grubbed so as to retain the root structure and support rapid regeneration of vegetation. All disturbed areas will be protected from erosion, shoreline integrity will be restored, and revegetated with native species, including trees. When the temporary disturbance, erosion protection, and revegetation are considered, NOAA Fisheries concludes that, with the addition of the native tree species as described in the revegetation plan, the net effect of the proposed action will, over time, be an incremental improvement over the baseline streambank condition.

*Habitat Access: Physical Barriers.* Under present conditions, Mill Creek at the diversion ditch is a barrier to upstream passage at low flows. Past management of the irrigation diversion has created a 4-foot drop in the stream that prevents upstream passage at low flows. Appropriate screening at the diversion, and installation of the cross-vane weirs, will provide upstream and downstream access for both adult and juvenile salmonids. The amount of habitat that will be accessible is still limited by additional barriers upstream of the proposed project, within the jurisdiction of the USDA Wenatchee National Forest, which prevent complete access to the headwaters. The net effect of the proposed action will be a removal of all fish passage barriers within the footprint of the project.

#### *2.2.1.2 Indirect Effects*

Indirect effects are defined in 50 CFR 402.02 as “those that are caused by the proposed action and are later in time, but still are reasonably certain to occur.” They include the effects on listed species or critical habitat of future activities that are induced by the proposed action and that occur after the action is completed. Indirect effects may occur outside of the area directly affected by the action. Indirect effects might include other Federal actions that have not undergone section 7 consultation but will result from the action under consideration. These

actions must be reasonably certain to occur, or be a logical extension of the proposed action.

Analysis of the project did not disclose any indirect effects.

### 2.2.2 Population Level Effects of the Action

As detailed in section 2.1.2, NOAA Fisheries has estimated the median population growth rate ( $\lambda$ ) for each species affected by this project. Under the environmental baseline, life history diversity has been limited by the influence of hatchery fish, by physical barriers that prevent migration to historical spawning and/or rearing areas, and by water temperature barriers that influence the timing of emergence, juvenile growth rates, or the timing of upstream or downstream migration. In addition, hydropower development has profoundly altered the riverine environment and those habitats vital to the survival and recovery of the ESUs that are the subject of this consultation.

The Mill Creek FRIMA Project is expected to add temporary, construction-related effects to the existing environmental baseline. A permanent effect of the project will be to provide appropriate fish passage at the project area which will allow juveniles and adults to move upstream of the project area. As mentioned above, additional passage barriers upstream of the project continue to block access to portions of the stream. Overall, these effects, as detailed above, are not expected to have any significance at the population level. Therefore, NOAA Fisheries believes that the proposed action does not contain measures that are likely to influence population trends of the affected ESU.

### 2.2.3 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." These activities within the action area also have the potential to adversely affect the listed species and critical habitat. Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities are being reviewed through separate section 7 consultation processes. Federal actions that have already undergone section 7 consultations have been added to the description of the environmental baseline in the action area.

State, tribal, and local government actions will likely be in the form of legislation, administrative rules or policy initiatives. Government and private actions may encompass changes in land and water uses—including ownership and intensity—any of which could adversely affect listed species or their habitat. Government actions are subject to political, legislative, and fiscal uncertainties.

Changes in the economy have occurred in the last 15 years, and are likely to continue, with less large-scale resource extraction, more targeted extraction, and significant growth in other economic sectors. Growth in new businesses, primarily in the technology sector, is creating urbanization pressures and increased demands for buildable land, electricity, water supplies,

waste-disposal sites, and other infrastructure.

Economic diversification has contributed to population growth and movement, and this trend is likely to continue. Such population trends will result in greater overall and localized demands for electricity, water, and buildable land in the action area; will affect water quality directly and indirectly; and will increase the need for transportation, communication, and other infrastructure. The impacts associated with these economic and population demands will probably affect habitat features such as water quality and quantity, which are important to the survival and recovery of the listed species. The overall effect will likely be negative, unless carefully planned for and mitigated.

Agricultural activities are presently the main land use in the action area. Summer low flows are modified by irrigation diversions, and riparian buffers contain little woody vegetation. Consistent instream flows are essential for fish survival. Riparian habitat is essential to salmonids in providing and maintaining various stream characteristics such as; channel stabilization and morphology, leaf litter, and shade. Given the patterns of riparian development in the action area and rapid human population growth of Chelan County (27.5% from 1990-2000, U.S. Census Bureau), it is reasonably certain that some riparian habitat will be impacted in the future by non-Federal activities. Although land use practices that would result in take of endangered species is prohibited by section 9 of the ESA, such actions do occur. However, NOAA Fisheries cannot conclude with certainty that any particular riparian habitat will be modified to such an extent that take will occur.

The state of Washington has various strategies and programs designed to improve the habitat of listed species and assist in recovery planning. Washington's 1998 Salmon Recovery Planning Act provided the framework for developing watershed restoration projects and established a funding mechanism for local habitat restoration projects. The Watershed Planning Act, also passed in 1998, encourages voluntary planning by local governments, citizens, and Tribes for water supply and use, water quality, and habitat at the Water Resource Inventory Area or multi-Water Resource Inventory Area level. Washington's Department of Fish and Wildlife and tribal co-managers have been implementing the Wild Stock Recovery Initiative since 1992. The co-managers are completing comprehensive species management plans that examine limiting factors and identify needed habitat activities. The state is also establishing the Lower Columbia Fish Recovery Board to begin drafting recovery plans for the lower Columbia region. Water quality improvements will be proposed through development of Total Maximum Daily Loads (TMDL). The state of Washington is under a court order to develop TMDL management plans on each of its 303(d) water-quality-listed streams. It has developed a schedule that is updated yearly; the schedule outlines the priority and timing of TMDL plan development. These efforts should help improve habitat for listed species. Washington State closed the mainstem Columbia River to new water rights appropriations in 1995, but lifted this moratorium in 2002. The state has proposed to mitigate the effects of new appropriations by purchasing or leasing replacement water when Columbia River flow targets are not met. The efficacy of this program is unknown at this time.

## **2.3 Conclusion**

NOAA Fisheries has reviewed the direct and indirect of the proposed action, and cumulative effects, on the above listed species and their habitat. NOAA Fisheries evaluated these effects in light of existing conditions in the action area and the measures included in the action to minimize harmful effects. While the proposed action is likely to cause short-term adverse effects to listed salmonids by modifying habitat and construction activities, these effects are unlikely to reduce salmonid distribution, reproduction, or numbers in any meaningful way. Consequently, the proposed action is not likely to jeopardize the continued existence of listed UCR spring chinook and/or UCR steelhead.

## **2.5 Reinitiation of Consultation**

As provided in 50 CFR 402.16, reinitiation of formal consultation is required if: 1) the amount or extent of taking specified in the Incidental Take Statement is exceeded, or is expected to be exceeded; 2) new information reveals effects of the action may affect listed species in a way not previously considered; 3) the action is modified in a way that causes an effect on listed species that was not previously considered; or 4) a new species is listed that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease, pending conclusion of the reinitiated consultation.

## **2.6 Incidental Take Statement**

The ESA at section 9 (16 U.S.C. 1538) prohibits take of endangered species. The prohibition of take is extended to threatened species by section 4(d) and by rule (50 CFR 223.203). Take is defined by the statute as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” (16 U.S.C. 1532(19)). Harm is defined by regulation as “an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavior patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering.” (50 CFR 222.102). Harass is defined as “an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering.” (50 CFR 17.3). Incidental take is defined as “takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant.” (50 CFR 402.02). The ESA at section 7(o)(2) removes the prohibition from any incidental taking that is in compliance with the terms and conditions specified in a section 7(b)(4) incidental take statement (16 U.S.C. 1536). An incidental take statement specifies the effect of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize effects and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

### 2.6.1 Amount or Extent of Take

As stated in section 2.1.2, above, UCR steelhead and UCR spring chinook use the action area for rearing. Juveniles of both species are therefore likely to be present in the action area any day of the year, making incidental take of these listed fish reasonably certain to occur. Take caused by the proposed action is likely in the form of harm, where habitat modifications (disturbance to the riparian area and within the channel in the location of the cross-vane weirs will) temporarily impair normal behavior patterns of listed salmonids, to such a degree that it injures or kills fish.

Because both the presence of fish, and the numbers they may be present in, are highly variable, the amount or extent of take resulting from harm is difficult, if not impossible to estimate. In instances where the number of individual animals to be taken cannot be reasonably estimated, NOAA Fisheries uses a surrogate approach. The surrogate should provide an obvious threshold of exempted take which, if exceeded, provides a basis for reinitiating consultation. In this case the surrogate is the measure of riparian and instream habitat to be affected. The extent of take is anticipated to be those fish that may be present during the temporary disturbance of 100 lineal feet of stream channel and 2,800 square feet of associated riparian area, and a temporary increase in turbidity within 100 feet downstream of the project area.

The exempted take includes only take caused by the proposed action, within the action area as described in this Opinion. If the proposed action results in a greater area being disturbed or if turbidity exceeds the specified standards, the FWS will need to reinitiate consultation. The proposed action includes measures to reduce the likelihood and amount of incidental take. To ensure the action agency will implement these measures, take minimization measures included as part of the proposed action are restated in the Terms and Conditions provided below.

### 2.6.2 Reasonable and Prudent Measures

Reasonable and Prudent Measures (RPMs) are non-discretionary measures considered necessary to minimize the impact of take. They may or may not already be part of the description of the proposed action. The action agency, the applicant, or both must implement the RPMs consistently with the Terms and Conditions below, for the exemption from the take prohibition of section 7(o)(2) to apply. The FWS has the continuing duty to regulate the activities covered in this incidental take statement. If the FWS fails to require the applicants to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, or fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. NOAA Fisheries believes that activities carried out in a manner consistent with these RPMs, except those otherwise identified, will not necessitate further site-specific consultation.

Activities which do not comply with all relevant RPMs or Terms and Conditions will require further consultation. NOAA Fisheries believes that the following RPMs are necessary and appropriate to minimize take of listed fish resulting from implementation of the action.

1. The FWS will minimize incidental take from isolation and fish handling activities.
2. The FWS will minimize incidental take from in-water construction activities.
3. The FWS will minimize incidental take from effects on riparian and instream habitat.
4. The FWS will ensure take is minimized by monitoring the effects of the proposed action.

### 2.6.3 Terms and Conditions

To be exempt from the prohibition against take found at section 9 of the ESA, the action must be implemented in compliance with the following terms and conditions, which detail the implementation of the reasonable and prudent measures, listed above, for each category of activity. These terms and conditions are non-discretionary.

1. To implement RPM No. 1 (isolation and fish handling) the FWS will ensure that the work area is isolated from the flowing stream, and fish handling is conducted, using the measures outlined below.
  - a. Install block nets at upstream and downstream locations to isolate the entire affected stream reach and prevent fish and other aquatic wildlife from moving into the work area. Block net mesh size, length, material, and depth will vary based on site conditions. Block net mesh size is the same as seine material (approximately one-quarter-inch stretched). The FWS will ensure that block nets are installed securely along both banks and in the channel to prevent failure during unforeseen rain events or debris build-up. Some locations may need added block net support such as galvanized hardware cloth, extra stakes, or metal fenceposts. Block nets will remain in place throughout the activity and debris removed to ensure proper function. Following initial environmental staff oversight, a staff person will check and maintain the nets. Crew supervisors, leads, or crew members may check these nets. The flow rate in the stream and the amount of debris collected on the net will determine how often to check and clean the nets.
  - b. Fish removal procedures will minimize handling and stress to the maximum extent possible. Dip, seine or fyke net exclusion procedures are as follows: After isolating the stream reach, remove all observable fish and other aquatic life with the least amount of handling (Appendix 1). Immediately place any aquatic life captured by hand or with into dark colored five-gallon buckets filled with clean stream water.
  - c. Handling of captured fish will be minimized and an appropriate environment for the stressed fish will be available. The FWS will minimize crowding and holding time. Keep large fish separated from smaller fish to avoid predation during

containment. Consideration of the need for supplemental oxygen, water to water transfers, and the use of shaded or dark containers when designing fish handling operations.

- d. Any accidental injury or killing of listed species will be reported to WDFW and NOAA Fisheries within two working days of occurrence (Appendix 1). Initial notification of fish mortality may be verbal, followed by a written in-water construction monitoring report (Appendix 1).
  - e. The capture team must handle ESA-listed fish with extreme care, keeping fish in water to the maximum extent possible during capture and transfer procedures to prevent the added stress of out-of-water handling.
  - f. Captured fish must be released outside of the isolated work area, as near as possible to the capture area.
  - g. NOAA Fisheries or its designated representative must be allowed to accompany the capture team during the capture and release activity, and must be allowed to inspect the capture team's capture and release records and facilities.
  - h. All take of listed salmonids during work area isolation must be documented and reported using the format attached in Appendix 1. The FWS will ensure that NOAA Fisheries receive the monitoring reports of take within one month beginning when the initial work area isolation activities commence until in-water construction activities cease. The reports will be sent to NOAA Fisheries, Attention: Diane Driscoll, 510 Desmond Drive SE, Suite 103, Lacey, WA 98503.
2. To implement RPM No. 2, (construction activities near the stream) above, the FWS will ensure that:
- a. All work within the active channel will be completed during November or December 2003 when the flow in Mill Creek is expected to be less than 1 cfs.
  - b. Construction methods will not cause turbidity to extend beyond 100 feet downstream of the project area (as described in WAC-201-100 and WAC-201-110) (WDOE 2003). The use of a mixing zone is intended for brief periods of time (a few hours or a few days) and is not intended as authorization to exceed turbidity standards for the duration of the project. In addition, a mixing zone is only allowed after the implementation of appropriate best management practices to avoid or minimize disturbance of sediment.
  - c. All equipment used for in-water work will be cleaned prior to entering the active channel of Mill Creek and will be "diapered" or otherwise protected to prevent introducing hazardous material within the OHWM. External oil and grease will

be removed. Untreated wash and rinse water will not be discharged into surface waters without adequate treatment to remove debris, nutrients, sediment, petroleum hydrocarbons, metals, and other pollutants likely to be present.

- d. The Contractor will comply with a Standard Pollution Prevention Control and Countermeasures Plan that will minimize the risk of spills and establish efficient response strategy in the event of a spill.
  - e. All Temporary Erosion and Sediment Control (TESC) measures included in the BA are included as provisions in the contract.
  - f. Areas for fuel storage, refueling, and servicing of construction equipment and vehicles will be at least 150 feet from the stream channel and all machinery fueling and maintenance will occur within a contained area. Overnight storage of vehicles and equipment must also occur in designated staging areas.
3. To implement RPM No. 3 (riparian and in-stream habitat protection), the FWS will ensure that:
- a. Alteration of native vegetation will be minimized. Where native vegetation is altered, measures will be taken to ensure that roots are left intact. This will reduce erosion while still allowing room to work. No protection is extended to invasive species (e.g., Himalayan blackberry) although no chemical treatment of invasive species will be used.
  - b. Riparian vegetation that is removed will be replaced with a native species mix of seeds, shrubs and trees.
  - c. Rock used for construction of the cross-vane weirs will be clean, angular rock, of the minimum possible size. Rock will be “placed” not dumped, and will be installed to withstand the 100 year peak flow.
4. To implement RPM No. 4 (monitoring), the FWS will ensure that:
- a. Erosion control measures as described above in RPM No. 2 will be monitored for effectiveness.
  - b. All riparian plantings will be monitored yearly for three years to ensure that finished grade slopes are at stable angles of repose and that woody plantings are achieving a minimum of 80% cumulative survival.
  - c. If the success standard specified above in RPM 4.b is not achieved, dead plantings will be replaced to bring the site into conformance. If failed plantings are deemed unlikely to succeed, replacement plantings will be installed at other

appropriate locations in the project area.

- d. By December 31 of the year following the completion of construction, the FWS will submit a monitoring report with the results of the monitoring required in terms and conditions 4.a and 4.b above. Send reports to NOAA Fisheries, Attention: Diane Driscoll, 510 Desmond Drive SE, Suite 103, Lacey, WA 98503
- e. In each of the two years following completion of construction, the FWS will submit to NOAA Fisheries (Washington Branch) a monitoring report with the results of monitoring requirements of 4.a and 4.b above. Send reports to NOAA Fisheries, Attention: Diane Driscoll, 510 Desmond Drive SE, Suite 103, Lacey, WA 98503.

If a sick, injured, or dead specimen of a threatened or endangered species is found, the finder must notify the Vancouver Field Office of NOAA Fisheries Law Enforcement at (360) 418-4246. The finder must take care in handling sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.

All terms and conditions shall be included in any permit, grant, or contract issued for the implementation of the action described in this Opinion.

### **3.0 MAGNUSON-STEVENSON FISHERY CONSERVATION AND MANAGEMENT ACT**

#### **3.1 Statutory Requirements**

The MSA established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan.

Pursuant to the MSA:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (section 305(b)(2)).
- NOAA Fisheries must provide conservation recommendations for any Federal or State action that may adversely affect EFH (section 305(b)(4)(A)).
- Federal agencies must provide a detailed response in writing to NOAA Fisheries within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting

the impact of the activity on EFH. In the case of a response that is inconsistent with NOAA Fisheries EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (section 305(b)(4)(B)).

The EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA section 3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species fecundity), site-specific, or habitat-wide impacts: including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

An EFH consultation with NOAA Fisheries is required for any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action may adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects on EFH.

### **3.2 Identification of Essential Fish Habitat**

Pursuant to the MSA the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of federally-managed Pacific salmon: chinook (*Oncorhynchus tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies presently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (i.e., natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based, in part, on this information.

### **3.3 Proposed Actions**

The proposed action is detailed above in sections 1.2 and 1.3 of this document. The project area includes habitats that have been designated as EFH for various life-history stages of chinook and coho salmon.

### **3.4 Effects of Proposed Action on Essential Fish Habitat**

The effects on chinook and coho salmon are the same as those for ESA-listed species and are described in detail in section 2.2 of this document. The proposed action may result in short-term adverse effects on a variety of habitat parameters. These adverse effects are:

1. Short-term degradation of benthic foraging habitat because of the disturbance of approximately 100 lineal feet of stream channel.
2. Short-term degradation of water quality in the action area because of an increase in turbidity during in-water construction and the potential for contaminants to reach the stream.
3. Temporary loss or disturbance of 100 lineal feet of streambank and 2,800 square feet of riparian vegetation because of construction access and excavation for cross-vane weirs.

### **3.5 Conclusion**

NOAA Fisheries concludes that the proposed action may adversely affect designated EFH for chinook and coho salmon.

### **3.6 Essential Fish Habitat Conservation Recommendations**

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations to Federal agencies regarding actions that may adversely affect EFH. While NOAA Fisheries understands that the conservation measures described in the BA will be implemented by the FWS, it does not believe that these measures are sufficient to address the adverse impacts to EFH described above. Consequently, NOAA Fisheries recommends that FWS implement the following actions to minimize the potential adverse effects to EFH for chinook and coho salmon:

1. To minimize EFH adverse effect No. 1 (degradation of benthic foraging habitat) the FWS should ensure that:
  - a. Mechanical equipment will operate from the streambank to the maximum extent practicable.
  - b. All equipment will be cleaned and protected before entering the active channel.

2. To minimize EFH adverse effect No. 2 (water quality), the FWS should ensure that:
  - a. The contractor has a Spill Prevention Control and Containment Plan (SPCC) and a TESC Plan in place prior to the start of any construction activities.
  - b. Turbidity plumes do not extend greater than 100 feet downstream of the project area when flows are less than 10 cfs.
3. To minimize EFH adverse effect No. 3 (loss of riparian habitat), the FWS should:
  - a. Ensure that streambank alteration does not extend beyond a total of 100 linear feet.
  - b. Minimize alteration of native vegetation and where possible, mow to keep root systems intact, increasing bank stability and speed of regeneration.
  - c. Replant the disturbed area with native species including trees to provide potential woody material to the stream.

### **3.7 Statutory Response Requirement**

Pursuant to the MSA (section 305(b)(4)(B)) and 50 CFR 600.920(k), Federal agencies are required to provide a detailed written response to NOAA Fisheries' EFH conservation recommendations within 30 days of receipt of these recommendations. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity on EFH. In the case of a response that is inconsistent with the EFH conservation recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

### **3.8 Supplemental Consultation**

The action agency must reinitiate EFH consultation with NOAA Fisheries if the proposed action is substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920(1)).

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## 5.0 APPENDIX 1

### In-Water Construction Monitoring Report Mill Creek FRIMA Project (2003/00619)

Start Date: \_\_\_\_\_

End Date: \_\_\_\_\_

Waterway: Mill Creek, Chelan County

Construction Activities:

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Number of fish observed: \_\_\_\_\_

Number of salmonid juveniles observed (what kind?): \_\_\_\_\_

Number of salmonid adults observed (what kind?):

\_\_\_\_\_

What were fish observed doing prior to construction? \_\_\_\_\_

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What did the fish do during and after construction? \_\_\_\_\_

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Number of fish stranded as a result of this activity: \_\_\_\_\_

How long were the fish stranded before they were captured and released to flowing water?

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Number of fish that were killed during this activity: \_\_\_\_\_

***Send report to:***

National Marine Fisheries Service, Attention Diane Driscoll, Washington State Habitat Branch,  
510 Desmond Dr. SE, Suite 103, Lacey, WA 98503